Remarks

Claims 1-47 are pending in the present application. Applicants respectfully request consideration of the present claims in view of the following remarks.

I. Claim Rejections under 35 U.S.C. §112, Second Paragraph

The Examiner rejected Claims 1-47 under 35 U.S.C. §112, second paragraph, as indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. In particular, the Examiner remarked that the claims merely set forth physical characteristics desired in an article and not specific compositions which would meet such characteristics, and are thus invalid as vague and indefinite because they cover any conceivable combination of ingredients. The Examiner furthered found that Claims 1-47 would impart desired characteristics too broad and indefinite since they purport to cover everything which will perform the desired functions, regardless of composition, and thus in effect, recite compounds by what they do rather than what they are. Applicants respectfully traverse this rejection for the following reasons.

Applicants respectfully assert that the breath of a claim is not to be equated with indefiniteness. MPEP §2173.04. Moreover, "if the scope of the subject matter embraced by the claims is clear, and if applicants have not otherwise indicated that they intend the invention to be of a scope different from that defined in the claims, then the claims comply with 35 U.S.C. §112, second paragraph." *Id.* Claims 1-47 clearly set forth the subject matter which Applicants regard as their invention. The scope of each claim is clearly defined at least in terms of the fluid properties of Applicants' claimed invention, and Applicants have not otherwise indicated that they intend the invention to be of a scope different from that defined in the claims. Thus, Claims 1-47 comply with 35 U.S.C. §112, second paragraph. Applicants also assert that scope of a claim may be defined by relevant identifying physical characteristics, such as physical properties. Applicants note that the Written Description Guidelines provide that an "applicant may show that an invention is complete by disclosure of sufficiently detailed, relevant identifying characteristics which provide evidence that applicant was in possession of the claimed invention, i.e., complete or partial structure, other physical and/or chemical properties, functional characteristics when coupled with a known or disclosed correlation between function and structure, or some

combination of such characteristics." 66 Fed. Reg. 1106 (January 5, 2001). Claims 1-47 recite sufficiently detailed, relevant identifying characteristics, in terms of the fluid properties of the claimed composites, which define the scope of Applicants' invention and provide evidence that Applicants were in possession of the claimed invention. Claims 1-47 clearly define the encompassed subject, and thus define what the patent precludes others from doing. *See In re Conley,* 409 F.2d 972 (C.C.P.A. 1974).

Applicants also assert that despite the Examiner's contentions regarding claiming an invention in terms of its desired functions, functional language is not objectionable in and of itself. *See* MPEP § 2173.05(g). "There is nothing indefinite in the use of claim language which defines particular amounts according to a functional criterion." *In re Spiller,* 500 F.2d 1170 (C.C.P.A. 1974) (*citing In re Fuetterer*, 319 F.2d 259 (1963), *In re Swinehart,* 439 F.2d 210 (C.C.P.A. 1971)). By definition, "functional" language defines an invention by what it does rather than what it is. *See Swinehart,* 439 F.2d at 212-213. Specifically, the *Swinehart* court remarked, "[w]e take the characterization 'functional' to indicate nothing more than the fact that an attempt is being made to define something (in this case, a composition) by what it does rather than by what it is (as evidenced by specific structure or material, for example)." *Id.* At 212. In fact, courts have "recognized the practical necessity for the use of functional language." *Id.* Therefore, Claims 1-47 may be properly defined in terms of the desired fluid functions of the claimed composites in order to define the invention by what it does, rather than by what it is.

Finally, Applicants assert that the second paragraph of 35 U.S.C. § 112 requires claims to set out and circumscribe a particular area with a reasonable degree of precision and particularity. *See In re Johnson*, 558 F.2d 1008, 1015 (C.C.P.A. 1977). In making this determination, the definiteness of the language employed in the claims must be analyzed, not in a vacuum, but always in light of the teachings of the prior art and of the particular application disclosure, as it would be interpreted by one possessing the ordinary level of skill in the pertinent art. *Id.* When the present Claims 1-47 are read in light of the disclosure, including the comparative examples, the claims are sufficiently clear.

For example, the specification on page 6, lines 6-28 and page 9, lines 29-37, provide various examples of superabsorbent materials that may comprise Applicants claimed composites. Various fibers are set forth on page 18, lines 16-34. Also, as set forth on page 17, lines 20-33, the superabsorbent material may be contained in a containment means that may include many

different types of fiber structures, including, but not limited to, air-laid or wet-laid fibrous matrices, meltblown webs of fibers, air laid heat-fused webs of synthetic materials, open-celled foams and the like. Additionally, as set forth on page 17, line 34 to page 18, line 15, the containment means may comprise a pocket comprising two layers of material, which may be cloth-like wovens and nonwovens, closed or open-celled foams, perforated films, elastomeric materials, or fibrous webs; or may comprise a polymeric film to which the superabsorbent material is attached.

In regards to the processing of the absorbent composites, as shown at page 20, lines 22-37, the superabsorbent material may be incorporated into a fibrous substrate, which includes, but is not limited to, nonwoven and woven fabrics. Alternatively, the superabsorbent material and fibrous material may be mixed, such as with a known air-mixing process, and may be distributed uniformly or non-uniformly (page 21, lines 3-18). The absorbent composite may contain a superabsorbent layer or layers, as described at page 21, lines 19-30.

Claims 1-47 must be read in light of the specification, and since the specification clearly defines the possible composite compositions and structures, Applicants respectfully assert that these claims are definite to one of ordinary skill in the art, who would be able to make and use Applicants' claimed invention using the descriptions set forth in the specification.

Therefore, for at least the reasons given above, Applicants respectfully assert that Claims 1-47 are definite and respectfully request the withdrawal of this rejection.

II. Prior Art Rejections

The Examiner rejected Claims 1-47 under 35 U.S.C. §102(b), as anticipated by, or in the alternative, under 35 U.S.C. §103(a), as obvious over, U.S. Patent No. 5,669,894 to *Goldman et al.* (hereafter "Goldman"). The Examiner found that Goldman discloses an absorbent member containing superabsorbent polymer and fibers. The Examiner asserted that although Goldman does not explicitly teach Applicants limitations of composite permeability and intake rate, it is reasonable to presume that these limitations are inherent to the Goldman invention, since Goldman uses similar materials (superabsorbent and fibers) and similar production steps (air-forming). The Examiner noted that Goldman discloses an absorbent polymer basis weight of 10 to 1000 grams per square meter, the use of polyacrylate as the superabsorbent, and the use of air-

forming steps in making the acquisition layer of the composite. Applicants respectfully traverse this rejection for the following reasons.

Applicants' Claim 1 is directed to an absorbent composite comprising about 20 to about 95 weight percent superabsorbent material, based on the total weight of the composite, and from about 80 to about 5 weight percent fibers, based on the total weight of the composite; wherein the composite has a Composite Permeability (CP), at full swelling, and 3rd Insult Fluid Intake Flowback Evaluation intake rate (IR) that are governed by the following equations, with CP values in units of cm^2:

when the IR value of the absorbent composite is greater than 0 ml/sec and less than 3.00 ml/sec, the CP value is given by $CP \geq \{135 - [(35/3) \times (3.00 - IR)]\} \times 10^{-8}$;

when the IR value of the absorbent composite is greater than about 3.00 ml/sec and less than 3.70 ml/sec, the CP value is given by $CP \geq \{175 - [(400/7) \times (3.70 - IR)]\} \times 10^{-8}$;

and when the IR value of the absorbent composite is greater than about 3.70 ml/sec, the CP value is greater than or equal to 175×10^{-8} cm^2.

Claim 38 is directed to a method of making an absorbent composite with the properties of Claim 1, and Claim 44 is directed to a disposable garment comprising at least one absorbent composite with the properties of Claim 1.

Goldman is directed to an absorbent member having at least one region containing an hydrogel-forming absorbent polymer in an amount from about 60-100% by weight. The absorbent polymer has a Performance under Pressure (PUP) capacity of at least about 23 g/g under a pressure of 0.7 psi (col. 7, lines 1-3). Applicants respectfully assert that Goldman fails to teach or suggest Applicants' claimed invention. The absorbent composites of the present invention have unique and unexpectedly high composite permeabilities, that may be seen from the results of test data as provided in Table 10 of the specification (page 37). The absorbent composites of the present invention comprise superabsorbent materials that have an Absorbency Under Load (AUL) of less than about 25 g/g at 0.6 psi, and a Gel bed Permeability (GBP) greater than about 70×10^{-9} cm^2. Thus, the composites of the present invention have a much higher composite permeability than prior art composites, but have a lower capacity. Moreover, due to the fact that the Goldman absorbent polymer and the superabsorbent materials of Applicants' invention have capacity values at opposite ends of the capacity spectrum, the composites of Applicants' invention have very different intake rate and composite permeability combinations

compared to the absorbent members disclosed in Goldman. As such, the present invention provides absorbent composites that are unconventional to prior art absorbent composites, such as the Goldman composites.

The Examiner alleges that since Goldman provides an absorbent member having similar materials (superabsorbent and fibers) and similar production step (air-forming), the absorbent member would inherently include the properties claimed by Applicants. Applicants respectfully traverse this statement. The Goldman absorbent members require an absorbent polymer with a high capacity of at least about 23 g/g at 0.7 psi. Goldman teaches high capacity superabsorbents. For example Goldman teaches, that its absorbent polymer (superabsorbent) "needs to be capable of absorbing large quantities of body fluids in a reasonable period of time under usage pressures." *See* column 11, lines 62-66. Goldman also teaches that in order for an absorbent core of minimal weight and thickness, to be able to deliver a high storage capacity, the absorbent polymer needs to have a relatively high PUP capacity. *See* column 12, lines 5-9. In fact, Goldman teaches away from a low capacity absorbent polymer, since an absorbent core with insufficient temporary holding capacity to contain subsequent gushes of body fluid, can leak prematurely. *See* column 12, lines 2-5. In addition, Goldman teaches that the absorbent polymer needs to be capable of absorbing large quantities of body fluid, or otherwise the absorbent member will be less effected at absorbing fluid. *See* column 11, line 64 –column 12, line 2. Thus, Goldman clearly teaches away from a low capacity superabsorbent, since such a superabsorbent would produce an absorbent member that is ineffective at absorbing fluid. Since Goldman uses high capacity superabsorbents, Applicants respectfully submit that Goldman absorbent members do not inherently possess the fluid properties of Applicants' claimed composites.

In contrast to Goldman, Applicants' have determined that lower capacity superabsorbents can provide improved composite performance. *See* page 7, lines 9-10 of the specification. Applicants have found that the higher capacity superabsorbents can be less effective because they are more prone to lower permeability, and the resultant composite cannot acquire liquid, at the rate required, during the life of the composite. Contrary to Goldman, the present invention uses lower capacity superabsorbents with high permeability, which in turn, provide high permeable, lower capacity composites, that are able to rapidly take in liquid and maintain constant or even improved fluid intake over the life of the composite. *See* page 7, lines 11-15 of the specification.

As a result, Applicants' composites are unconventional in that they exhibit higher permeability with a lower capacity. *See* page 14, lines 19-21 of the specification.

The Goldman absorbent products do not inherently possess the fluid properties of Applicants' claimed composites. Goldman discloses a PUP measurement that may be similar to Applicants' claimed AUL. However, Goldman discloses a lower limit on capacity, whereas Applicants disclose an upper limit on capacity. Goldman desires a PUP of at least about 23 g/g, 25 g/g or 29 g/g, at a pressure of 0.7 psi, for 60 minutes (col. 12, lines 22-31 and col. 57, lines 13-29). Applicants disclose an AUL of less than about 25 g/g, 24 g/g, 23 g/g or 21 g/g, at a pressure of 0.6 psi, for 60 minutes (specification pages 7-9, 26-27). While there might appear to be an overlap in these ranges, this is incorrect due to the fact that the measurements are at different pressures, and since it is well known in the art, that as pressure increases, capacity decreases. As such, if the pressure of the PUP measurements in Goldman were decreased to 0.6 psi, the resulting capacity would be greater than the 23 g/g taught. Conversely, if the pressure used in Applicants AUL measurement were increased, the resultant capacity would be less than 25 g/g claimed. As support for the premise that it is well known in the art that an increase in pressure results in a decrease in capacity, Applicants are providing herewith a copy of U.S. Patent No. 5,601,542, enclosed as Exhibit A, and direct the Examiner's attention specifically to the data set forth in Tables 2 and 5. This data clearly shows that as pressure increases, the capacity decreases. As support for the statement that Goldman fails to teach Applicants' claimed AUL due to the difference in pressure for the PUP versus the AUL tests, Applicants respectfully submit that an analysis of the 32 total samples in Tables 2 and 5 shows an average drop of about 2.5 g/g in capacity over the range of 0.6 psi to 0.7 psi. As such, Goldman's absorbent polymer should have a resulting PUP of at least 25.5 g/g at 0.6 psi. Since Goldman desires higher capacity absorbent polymers of at least about 23 g/g at 0.7 psi, it would not have been obvious to use a superabsorbent material with a capacity of less than 25 g/g at 0.6 psi, since this would teach away from the intended purpose of Goldman.

For at least the reasons given above, Applicants respectfully assert that Goldman fails to teach or suggest Claims 1, 38 and 44. Since Claims 2-37, 39-43 and 45-47 recite additional claim features and depend directly or indirectly from Claims 1, 38 and 44, Applicants also respectfully assert that Goldman fails to teach or suggest these remaining claims. Accordingly, Applicants respectfully request the withdrawal of this rejection.

It appears that the Examiner rejected Claims 1-47 under 35 U.S.C. §102(b), as anticipated by, or in the alternative, under 35 U.S.C. §103(a), as obvious over, U.S. Patent No. 5,676,660, to *Mukaida et al.* (hereafter "Mukaida"). Although it is not clear from the Office Action whether the Examiner made an official rejection under Mukaida, Applicants have herein responded to the Examiner comments regarding this reference to expedite prosecution. The Examiner found that Mukaida discloses an absorbent product comprising fiber and superabsorbent. The Examiner asserted that although Mukaida does not explicitly teach Applicants' limitations of composite permeability and intake rate, it is reasonable to presume that these limitations are inherent to the Mukaida invention, since Mukaida uses similar materials (superabsorbent and fibers) and similar production steps (air-forming) to produce the absorbent composite. The Examiner noted that Mukaida discloses an absorbent resin weight of 400 grams per square meter, the use of sodium polyacrylate as the superabsorbent, and an air-forming step. Applicants respectfully traverse this rejection for the following reasons.

Mukaida is directed to absorbent products comprising a liquid permeable surface sheet, a liquid non-permeable back sheet and an absorbent layer located between the surface and back sheets. Mukaida desires that these products have high capacities. Mukaida does not discuss permeabilities.

Applicants respectfully assert that the Mukaida products do not inherently possess the fluid properties of Applicants' claimed composites. Mukaida teaches absorbent products that require high capacities water-absorbent resins. The examples disclosed in Mukaida all use materials having an AUL of 28 g/g (0.3 psi, 30 minutes), or higher. Applicants respectfully submit that prior art superabsorbent materials, like those in Mukaida, desire higher capacities, without regard for how this fluid is absorbed by the final composite structure. As such, these materials can leak, since these high capacity composites can be less effective at acquiring liquid, at the rate required, during the life of the composite. As Mukaida fails to teach or suggest absorbent products that comprise low capacity resins, it is respectfully submitted that Mukaida fails to teach or suggest Applicants' claimed composites.

In addition, Mukaida teaches absorbent products that have intake rates that are comparably slower than what is taught in Applicants' invention. Mukaida's absorbent products have low intake rates, with the fastest rate measured at 1.6 ml/sec, resulting from a 49 second

absorption rate for 80 ml of artificial urine (Example 4 in Table 1 and col. 8, lines 23-35). Lower intake rates are indicative of absorbent products that comprise low permeability component(s), and thus have a lower composite permeability. Contrary to the absorbent products disclosed in Mukaida, Applicants' disclosed composites exhibit high intake rates of 2.1 ml/sec or greater (Table 10), indicative that these composites comprise high permeability component(s), and thus have a high composite permeability. This comparison shows that inherency does not exist in Mukaida, since the Mukaida products have much lower intake rates, and thus lower composite permeabilities, compared to Applicants' absorbent composites. Thus, Mukaida fails to teach or suggest Applicants' claimed composites.

Applicants also tested a commercial superabsorbent, Sanyo AD-890, which was shown to have fluid properties that fall within the properties disclosed in Mukaida, but outside the properties disclosed in Applicants' invention. Applicants' results demonstrate that the absorbent products in Mukaida do not inherently possess the fluid properties of Applicants' claimed composites. The Sanyo resin was analyzed to determine the following fluid properties: "Gel Bed Permeability," "Absorbency Under Loading (0.3 psi for 30 minutes)" and "Absorbency Under Pressure – Free State." The test for the Gel Bed Permeability was conducted according to Applicants' test procedure on pages 23-25 of the specification. The tests for the Absorbency Under Loading (0.3 psi for 30 minutes) and Absorbency Under Pressure – Free State were conducted, as closely as permissible, according to the same test procedures disclosed in Mukaida (col. 4, lines 1-20). For each test procedure, the Sanyo sample was tested in triplicate. The moisture content of the Sanyo sample was determined to be about 3%.

For the Gel Bed Permeability test, the Sanyo superabsorbent was sieved to a particle size of 300-600 microns. The sample had an average GBP of 58.3×10^{-9} cm^2.

For the Absorbency Under Loading (0.3 psi for 30 minutes) test, the sample was tested in its "as is" condition (no sieving) by placing 0.069 gram of the superabsorbent (M_{SAP}) into a cylinder (25.4 mm inside diameter) that had a 100 mesh stainless steel screen adhered to one end. This set-up yielded the same dry mass/area ratio as the 0.1 gram over the 30 mm cylinder disclosed in Mukaida. The superabsorbent was spread as uniformly as possible over the screen. A weight of 99.98 gm was placed on top of the superabsorbent, which resulted in a load of 19.7 gm/cm^2 (0.3 psi). The apparatus (cylinder containing the superabsorbent and weight) was placed into a nominal 12 cm diameter dish, which contained a 0.9% saline solution (60ml). The

apparatus was maintained in the saline solution for 30 minutes, after which time, the weight of the apparatus was determined ($M_{swollen}$). The AUL was determined from the M_{SAP}, $M_{swollen}$ and the average mass of a wet empty apparatus (cylinder and weight) subject to the same test procedure.

For the Absorbency Under Pressure – Free State test, the sample was tested in its "as is" condition (no sieving) by placing 1 gm of the superabsorbent (M_{SAPdry}) into a "teabag" formed from two sheets of heat-sealable teabag material that was cut to 26 cm x 7.5 cm (nominally the same area as 20 cm x 10 cm size disclosed in Mukaida). Three sides of the teabag layers were heat sealed prior to adding the superabsorbent. After adding the superabsorbent in between the layers, the fourth side of the layers was sealed. The teabag containing the superabsorbent was placed into a pan containing 0.9% sodium chloride, and allowed to absorb for 30 minutes. Following the 30 minute soaking, the wet teabag containing the swollen superabsorbent was hung vertically to drain for 15 minutes, and then weighed to determine the mass of the wet teabag and the swollen superabsorbent (M_{wet}). The "Absorbency Under Pressure – Free State" was determined from the M_{SAPdry}, M_{wet} and the average mass of a wet empty teabag subject to the same test procedure

The results show that the Sanyo superabsorbent is very similar to the absorbent resins disclosed in Mukaida. The Sanyo superabsorbent had similar Absorbency Under Loading and Absorbency Under Pressure – Free State, as the main absorbent resin disclosed in Mukaida (col.8, lines 64-67), as shown by the following average results.

Absorbency Under Loading (0.3 psi for 30 minutes) $_{SANYO}$ = 25.7g/g

Absorbency Under Loading (0.3 psi for 30 minutes) $_{MUKAIDA}$ = 28 g/g

Absorbency Under Pressure – Free State $_{SANYO}$ = 48.4 g/g

Absorbency Under Pressure – Free State $_{MUKAIDA}$ = 50 g/g

The above results indicate that the Sanyo superabsorbent fits the characteristics of the absorbent resin disclosed in Mukaida, and is a good representative of the of the high capacity absorbent resins disclosed in Mukaida. However, the Sanyo superabsorbent falls outside the scope of superabsorbent materials disclosed by Applicants, as shown by its significantly lower Gel Bed Permeability (GBP) of 53.8 x 10^{-9} cm^2. The superabsorbents used in Applicants' invention have GBP values greater than about 70 x 10^{-9} cm^2. The Gel Bed Permeability results indicate that the high capacity absorbent resins in Mukaida, as represented by the Sanyo

superabsorbent, result in lower composite permeabilities, compared to the composites used in Applicants' invention. Low GBP superabsorbents result in low composite permeability. This is also confirmed by the comparably lower intake rates of the Mukaida products compared to the intake rates of Applicants' composites. Lower intake rates correlate with lower composite permeabilities, which may be caused by lower Gel Bed Permeabilities. The composite of Applicants' invention achieve a rapid intake rate by increasing the permeability of the composite. Applicants' claimed composites provide higher intake rates and composite permeabilities than prior art composites. As a result, Applicants' composites are unconventional in that they exhibit higher permeability with a lower capacity. Thus, Applicants respectfully submit that the absorbent products disclosed in Mukaida do not inherently possess the claimed fluid properties of Applicants' composites.

Therefore, for at least the above reasons, Applicants respectfully assert that Mukaida fails to teach or suggest Claims 1, 38 and 44. Since Claims 2-37, 39-43 and 45-47 recite additional claim features and depend directly or indirectly from Claims 1, 38 and 44, Applicants also respectfully assert that Mukaida fails to teach or suggest these remaining claims. Accordingly, Applicants respectfully request the withdrawal of this rejection.

III. Double Patenting

The Examiner provisionally rejected Claims 1-47, under the judicially created doctrine of obviousness-type double patenting, over claims 1-23, 31 and 32 of copending U.S. Patent Application 09/475,830. Applicants assert that the present invention differs from the claims in the above-referenced U.S. patent application. However, to expedite prosecution, Applicants will submit a terminal disclaimer should allowable subject matter be found.

IV. Conclusion

For at least the reasons given above, Applicants respectfully submit that Claims 1-47 define patentable subject matter. Accordingly, Applicants respectfully request allowance of these claims.

The foregoing is submitted as a full and complete Response to the Office Action of January 29, 2003. Early and favorable consideration of the claims is requested.

Should the Examiner believe that anything further is necessary in order to place the application in better condition for allowance, the Examiner is respectfully requested to contact Applicants' representative at the telephone number listed below.

No additional fees are believed due; however, the Commissioner is hereby authorized to charge any deficiency, or credit any overpayment, to Deposit Account No. 11-0855.

Respectfully submitted,

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